Operating Instructions

MT-xx6-A

Series 300 EAGLE
Series 400 Panel PC
Series 500 Thin Clients

(valid for HW Revision 3)

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1 Preface

These Operating Instructions contain all aspects relevant to explosion protection for the MT-xx6-A operator interfaces (series 300 Eagle, series 400 Open HMI - Panel PC´s and series 500 Remote HMI Thin Clients). They also contain information on the connection and installation of these devices. Please also refer to additional documentation included in the delivery, such as the examination certificate and the hardware manual, which contain further important information.
These operating instructions contain a joint description of all three product lines: Eagle, Panel PC´s and Thin Clients. Any differences between the three product lines will be explicitly mentioned and dealt with. As a rule, though, the information contained in these operating instructions applies to all models of the MT-xx6-A series.
The MT-xx6-A operator interfaces with display sizes of 26 cm/10.4", 38 cm/15" and 48 cm/19" will be available in Hardware Revision 3.

⚠ For the correct operation of all associated components please note, in addition to these operating instructions, all other operating instructions enclosed in this delivery as well as the operating instructions of the additional equipment to be connected.

⚠ Please also note that all certificates of the operator interfaces can be found in a separate document !

2 Device function

The MT-xx6-A operator interfaces are explosion-proof equipment for installation in hazardous areas and can be installed in zones 2 and 22 with outputs for zones 1 and 21.
All devices have a modular structure, which makes changes and maintenance easy. They can be integrated into control cabinets or panels, etc.

2.1 MT-3x6-A (Series 300 EAGLE)

The MT-3x6-A operator interfaces have been designed for the visualisation of medium-sized automation tasks, operation as built-in device and tankfarm application in hazardous areas. The EAGLE operating stations have been designed to run with a proprietary operating system, making them highly secure against external manipulation.
Users operate the device via the membrane keyboard integrated into the front plate and via the LCD display with touch screen.
Communication with control and automation systems runs via the serial interfaces (RS-232 RS-422/485, Ethernet) connected in the "e"-area at the back of the devices. Various peripheral devices, such as barcode scanners, card readers, USB sticks and WLAN / Bluetooth modules can be connected via USB interfaces or optional fitted modules.
With a wealth of functions, these operator interfaces provide optimum visualization. Their active communication concept in combination with integrated functionality reduce the automation system workload.

2.2 MT-4x6-A (Series 400 Panel PC)

The MT-4x6-A devices are robust Panel PCs for hazardous areas. With their pre-installed Windows operating systems they are ready to run straight away.
As a standard, all Panel PC`s are equipped with a touch screen and several interfaces and are based on the powerful ATOM technology (1.6 GHz clock frequency), making them the most powerful devices on the market.

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2.3 MT-5x6-A (Series 500 Thin Clients)

The MT-5x6-A devices of the 500 series can be integrated into modern networks as Thin Clients or with a KVM box via KVM-over-IP, thus providing ideal and flexible access options with central data administration.
The MT-5x6 device, which are used for operation and visualization, are located in the hazardous area, whereas the PC that is operated is located in the safe area. Each ERP/MES network can be accessed from each Thin Client via the IP address.
The Thin Client system supports both modern technologies such as DVI and USB and older technologies such as VGA and PS/2.

3 Technical Data

Function / Equipment	**MT-306-A MT-406-A**	**MT-316-A MT-416-A**	**MT-336-A MT-436-A-(SR) MT-536-A-(SR)**	**MT-456-A MT-556-A**
Display type	TFT Color, 16,777,216 Colors			
Display size	26 cm (10.4")		38 cm (15")	48 cm (19")
Resolution in pixels	MT-306-A VGA 640 x 480 MT-406-A SVGA 800 x 600	SVGA 800 x 600	XGA 1024 x 768	SXGA 1280 x 1024
Display	Touch screen on glass			
Touch Screen normal	8-wire analogue resistive			
Sunlight readable	-		5-wire analogue resistive	-
Backlight	LED background lighting			
Service life of backlight at +10°C	130,000 h		500,000 h	50,000 h
at +35°C	55,000 h		70,000 h	-
at +55°C	40,000 h		50,000 h	-
Brightness normal	VGA 450 cd/m² | SVGA 400 cd/m²		350 cd/m²	350 cd/m²
Sunlight readable	-		1000 cd/m²	-
Contrast normal	min. 500:1, typ. 700:1		min. 400:1, typ. 700:1	1000:1
Sunlight readable	-		typ. 600:1	-
Keyboard	Polyester membrane on aluminium plate (> 1 million actions)			
Functional keys	12	12	8	8
Soft keys	10	no	no	no
Cursor keys	Yes	no	no	no
Alphanumeric keys	12	no	no	no
System keys	14	no	no	no
Additional keyboard	optional 100 mA max. power consumption 105 Keys or 107 keys with integrated trackball / joystick (variant with trackball/joystick not for MT-3x6-A)			
Trackball/Joystick	optional for MT-4x6-A and MT-5x6-A			
Power supply	Directly in the integrated connection box			
Connections	via screw terminals, 2.5 mm² green (Ex-nA)			
Power supply	24 VDC (20.4 to 28.8 VDC)			
Power consumption [A]	1.2 A			
max. operating voltage U_m MT-xx6-A	30 VDC			
Real-time clock	Yes			
Data buffer	Lithium battery and capacitor buffered, maintenance-free			
Battery	> 5 years			
Capacitor	at least 4 days			

Function / Equipment	**MT-306-A** **MT-406-A**	**MT-316-A** **MT-416-A**	**MT-336-A** **MT-436-A-(SR)** **MT-536-A-(SR)**	**MT-456-A** **MT-556-A**
Status display LEDs below the back cover	for activity on - Solid state flash drive or HD - Ethernet link - COM 1 and COM 2			
Interfaces				
Ethernet	Either Tx or Fx			
Copper (Tx)	10/100BaseTx, 10/100 Mbit (Ex-nA)			
Optical fibre (Fx)	100BaseFx, 100 Mbit, inherently safe (Ex op is)			
USB	2x Ex-nA; 2x Ex-ib/ic			
PS/2	For external keyboard, mouse*, trackball*, joystick* (all Ex-ib/ic) * not available for MT-3x6-A			
Serial COM1	RS-232, RS-422, RS-485 (Ex-nA)			
Readers COM2	Barcode scanner, Wiegand reader, Proximity reader interface (all Ex-ib/ic)			
Fieldbus	not for Thin Client			
Eagle	Profibus with 9185/12-46-10 MPI with MPI Box SSW7-RK512-RS-422			
Panel PC	MPI with MPI Box SSW7-HMI-RS-422			
Audio	Line Out output (Ex-nA)			
Data cable/-lenght				
Copper (Tx)	up to 100 m via CAT5 installation cable AWG22			
Optical fibre (Fx)	up to 2000 m via 62,5/125 µm (core-/external cross section) multi-mode optical fibre cable			
Front plate	Polyester on seawater-proof aluminium with touch technology and safety glass (standard)			
	or			
	Stainless steel on seawater-proof aluminium with touch-technology and safety glass, F-keys polyester			
	-	-	yes (not MT-336-A)	yes
Housing	Stainless steel			
Housing protection type	IP66			
Operating temperature range				
Operation	- 20°C … + 55°C*			
Operation with heater *	- 30°C … + 55°C*			
Operation with heater **, housing insulation and protective screen	- 40°C … + 55°C*			
Storage temperature range	- 30°C … + 60°C			
* Comment	in the case of MT-4x6-A and MT-5x6-A: at +55°C for a maximum of 5 hours, at +50°C for continuous operation (24/7)			
** Comment	** The heater used must be of such a design that the temperature inside the operator interface's housing does not fall below -20°C (-30°C only at the front) !			
Heat dissipation	approx. 50 % via front plate, approx. 50 % via housing			
Relative humidity	90% at + 40 °C, without condensation			
Vibration				
Operation	3 to 22 Hz: 1 mm 22 to 500 Hz: 9.8 m/s² = 1 g			
Transport:	3 to 9 Hz: 3.5 mm 9 to 500 Hz: 9.8 m/s² = 1 g			
Shock loading				
Operation	150 m/s² = about 15 g / 11 ms			
Transport:	250 m/s² = about 25 g / 6 ms			
Dimensions [mm]				
Front (w x h)	400 x 270	372 x 270	440 x 340	535 x 425
Cut-out w x h [mm] (+/- 0.5)	385.5 x 257.5	359.5 x 257.5	427.5 x 327.5	522.5 x 412.5
Depth of cut-out	150		165	
Wall thickness	8			
Mounting position	vertical or horizontal			
Weight [kg]				
Device	13.00	12.60	17.30	23.5
Fixing frame	0.6	0.6	0.7	0.9

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3.1 Additionally for MT-3x6-A (EAGLE)

Processor	LX 800, 266 MHz
Main memory [Mbyte] Data memory [Mbyte]	256 256
Operating system:	RT Target
Languages	global, multilingual language support
Number of protocol drivers	a maximum of 4 simultaneously
Number of process images	> 1000 dynamic
Number of texts / messages	dynamically limited by main memory
Number of variables per page	255
Number of messages	4096 fault messages, 4096 operation messages
Font sets	4 independent Windows unicondensed fonts
Configuration memory type	Solid state flash drive

3.2 Additionally for MT-4x6-A (Open HMI)

Processor	ATOM 1.6 GHz
Working memory [GB] Data memory [GB]	1 or 2 4 or 16
Type of data memory	
Standard	Solid state flash drive
Optional	expansion to Exicom-SHD-xxx hard disk 100 GB instead of flash drive
Operating system	Windows XP Embedded Windows XP Professional Windows 7 Ultimate
Standard Software	WIN CC flexible, iFix, RSView (for further software solutions, please refer to our homepage)
Global language support	Via Multi-Language interface of Windows XP embedded (25 languages)

4 Conformity to standards

The MT-xx6-A operator interfaces comply with the following standards and directives:

Standard **Directive 94/9/EC** **1st supplement**	**Classification**
IEC 60079-0 : 2011	General requirements
IEC 60079-1 : 2007	Flameproof enclosure "d"
IEC 60079-7 : 2006	Increased safety "e"
IEC 60079-11 : 2011	Intrinsic safety "i"
IEC 60079-15 : 2010	Type of protection "n"
IEC 60079-18 : 2009	Encapsulation "m"
IEC 60079-28 : 2006	Optical radiation "op is"
IEC 60079-31 : 2008	Protected by enclosures "t" (dust)
Electromagnetic compatibility	
Directive 2004/108/EC	
EN 61326-1 : 2008	General requirements
IEC 61000-6-2 : 2005	Immunity
IEC 61000-6-4 : 2011	Emission

5 Certificates

The MT-xx6-A operator interfaces are certified for installation in the following areas:

according to ATEX Directive 94/9/EC
for installation in zones 2 and 22

IECEx (International Electrotechnical Commision System for Certification to Standards for Electrical Equipment for Explosive Atmospheres)
DNV (Det Norske Veritas)
LR (Lloyd´s Register)
GOST-R (Russion certification)
CSA (Canadian Standard Association)
UL-BR (UL do Brasil Certificações – INMETRO)

5.1 ATEX

The ATEX certificates are listed under the following certification numbers:

Certificate number for MT-xx6-A:	TÜV 11 ATEX 7103 X

5.2 IECEx

The IECEx certificates are listed under the following certification numbers:

Certificate number for MT-xx6-A:	IECEx TUR 11.0015X

You can access all IECEx certificates on the official website of the IEC under their certificate number. http://iecex.iec.ch/iecex/iecexweb.nsf/welcome?openform.

5.3 DNV

The DNV certification is listed below the following numbers:

Certificate number:	A-12989
File number:	899.60
Job Id:	262.1-001689-6

5.4 LR

The LR (Lloyd´s Register) certificate is listed under the following certification number:

Certificate number:	11/20032

5.5 GOST-R

The GOST-R certification is listed below the following number:

Certificate number:	РОСС DE.ГБ04.В01741

5.6 CSA

The CSA certificate is listed under the following certification number:

Certificate number:	2512677

5.7 UL-BR

The UL-BR certificate is listed under the following certification number:

Certificate number:	UL-BR 12.0398X

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6 Marking

Manufacturer	R. STAHL HMI Systems GmbH	
Type code	MT-3x6-A / MT-4x6-A / MT-5x6-A	
CE classification:	CE 0158	
Testing authority and certificate number:	TÜV 11 ATEX 7103 X IECEx TUR 11.0015X	
Ex classification:		
ATEX guideline 94/9/EC MT-xx6-A-Tx		II 3 (2/3) G Ex d e ia ib mb nA [ib Gb] [ic] IIC T4 Gc II 3 (2/3) D Ex ia tc [ib Db] [ic] IIIC T80°C Dc IP66
MT-xx6-A-Fx		II 3 (2/3) G Ex d e ia ib mb nA [ib op is Gb] [ic] IIC T4 Gc II 3 (2/3) D Ex ia tc [ib op is Db] [ic] IIIC T80°C Dc IP66
IECEx MT-xx6-A-Tx		Ex d e ia ib mb nA [ib Gb] [ic] IIC T4 Gc Ex ia tc [ib Db] [ic] IIIC T80°C Dc IP66
MT-xx6-A-Fx		Ex d e ia ib mb nA [ib op is Gb] [ic] IIC T4 Gc Ex ia tc [ib op is Db] [ic] IIIC T80°C Dc IP66
GOST-R MT-xx6-A-Tx		2ExdeiaibmbnA[ib][ic]IICT4 DIP A21 TA80°C, IP66
MT-xx6-A-Fx		2ExdeiaibmbnA[ibopis][ic]IICT4 DIP A21 TA80°C, IP66
CSA		Ex d e ia ib mb nA [ib Gb] [ic] IIC T4 Gc, Type 4X, IP66 Class II, Division 2, Groups E, F, G, T80°C Ex ia tc [ib ic] IIIC T80°C Dc, IP66
UL-BR MT-xx6-A-Tx		Ex d e ia ib mb nA [ib Gb] [ic] IIC T4 Gc Ex ia tc [ib Db] [ic] IIIC T80°C Dc IP66
MT-xx6-A-Fx		Ex d e ia ib mb nA [ib op is Gb] IIC T4 Ex ia tc [ib op is Db] [ic] IIIC T80°C Dc IP66

7 Power supply

7.1 Operator interfaces

Power supply: 24.0 VDC (min. 20.4 VDC , max. 28.8 VDC)
Um = 30 VDC
(for connected circuits in zone 1)

Power consumption: MT-xx6-A 1.2 A

7.1.1 All circuits in zone 2 and 22

If the operator interface and all connected circuits are solely used in zone 2 or 22, the operator interface can be supplied with the required rated voltage of

U_{rated} = 24 VDC (+20% / -15%)

7.1.2 With circuits in zone 1 and 21

If the operator interface is run in zone 2 and connected to intrinsically safe circuits / devices in zone 1, the following applies:

U_m = 30 VDC

(see EN 60079-11 : 2007, section 3.16).

7.1.3 Operator interface terminals

Copper wires with cross sections of betwee 0.2 mm² (AWG 24) and 1.5 mm² (AWG 14) may be connected to any of the terminals of the operator interfaces.

☞ When connecting cables to the terminals please make sure that the insulation of the cables goes right up to the terminal contacts.

7.1.3.1 Tightening torque

For the terminals X1 and X11 a tightening torque of:
0,4 Nm up to 0,5 Nm is valid
and for the terminals X2, X3, X4, X5, X6, X7, X8 and X9 a tightening torque of:
0,5 Nm bis 0,6 Nm is valid.

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8 Permitted maximum values

8.1 External, non-intrinsically safe circuits

Input voltage (X1):

Rated voltage	24 VDC (+20% / -15%) (for exclusive operation in zone 2)
Power consumption for U_{rated}	1.2 A max
Max. operating voltage U_m	30 VDC (applies for connected circuits in zone 1)

RS-422/-232 COM 1 (X2):

Rated voltage	RS-422: 5 VDC	RS-232: ±12 VDC
Max. operating voltage U_m	253 VAC	

USB-1 (X5):

Rated voltage	5 VDC
Max. operating voltage U_m	253 VAC

USB-3 (X7):

Rated voltage	5 VDC
Max. operating voltage U_m	253 VAC

Copper Ethernet (X11):

Rated voltage	5 VDC
Rated power	100 mW
Max. operating voltage U_m	30 VDC

Audio (X3)

Rated voltage	5 VDC
Max. operating voltage U_m	253 VAC

8.2 External inherently safe optical interface

Ethernet optical fiber (X10):

Wavelength	1350 nm
Radiant power	≤ 35 mW

8.3 External intrinsically safe circuits

USB-0 (X4) and USB-2 (X6):

U_o	=	5.9	V
I_o	=	2.18	A
P_o	=	1.24	W

a) The maximum values for zone 1 group IIC are:

C_i	=	0	µF		C_o	=	5.1	11	28	43	µF
L_i	=	0	mH		L_o	=	10	5	2	1	µH

C_o and L_o pairs directly above/underneath each other may be used.

The maximum values for zone 1 group IIB are:

C_i	=	0	µF		C_o	=	14	40	79	200	µF
L_i	=	0	mH		L_o	=	50	20	10	5	µH

C_o and L_o pairs directly above/underneath each other may be used.

b) The maximum values for zone 2 group IIC are:

C_i	=	0	µF		C_o	=	12	24	74	670	µF
L_i	=	0	mH		L_o	=	10	5	2	1	µH

C_o and L_o pairs directly above/underneath each other may be used.

The maximum values for zone 2 group IIB are:

C_i	=	0	µF		C_o	=	37	92	200	790	µF
L_i	=	0	mH		L_o	=	50	20	10	5	µH

C_o and L_o pairs directly above/underneath each other may be used.

Reader RSi1 and RSi2 (X8) +Uint 1 (power supply circuit, X8.0, bridge to X8.2):

U_o	=	10.4	V
I_o	=	220	mA
P_o	=	2.29	W

a) The maximum values for zone 1 group IIC are:

C_i	=	1.72	µF		C_o	=	0.8	µF
L_i	=	0	mH		L_o	=	10	µH

C_o and L_o pairs directly above/underneath each other may be used.

b) The maximum values for zone 2 group IIC are:

C_i	=	1.72	µF		C_o	=	4.68	µF
L_i	=	0	mH		L_o	=	10	µH

C_o and L_o pairs directly above/underneath each other may be used.

Reader RSi1 (X8) +U_ex1 (power supply circuit, X8.2, bridge from X8.0):

U_i	=	12.4	V
I_i	=	220	mA
P_i	=	2.29	mW
C_i	=	25	nF
L_i	=	0	mH

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Reader RSi1 (power supply reader, X8.3-4):

U_o	=	5.36	V
I_o	=	220	mA
P_o	=	1.18	W

a) The maximum values for zone 1 group IIC are:

C_i	=	5.3	µF		C_o	=	40.7	59.7	µF
L_i	=	0	mH		L_o	=	2	1	µH

C_o and L_o pairs directly above/underneath each other may be used.

The maximum values for zone 1 group IIB are:

C_i	=	5.3	µF		C_o	=	70.7	124.7	µF
L_i	=	0	mH		L_o	=	2	1	µH

C_o and L_o pairs directly above/underneath each other may be used.

b) The maximum values for zone 2 group IIC are:

C_i	=	5.3	µF		C_o	=	124.7	994.7	mF
L_i	=	0	mH		L_o	=	2	1	µH

C_o and L_o pairs directly above/underneath each other may be used.

The maximum values for zone 2 group IIB are:

C_i	=	5.3	µF		C_o	=	154.7	324.7	µF
L_i	=	0	mH		L_o	=	20	10	µH

C_o and L_o pairs directly above/underneath each other may be used.

Reader RSi1 and RSi2 (signal input / output, X8.5-8):

U_i	=	15	V		U_o	=	5.36	V
I_i	=	500	mA		I_o	=	46	mA
P_i	=	2.5	W		P_o	=	62	mW

a) The maximum values for zone 1 group IIC are:

C_i	=	0	µF		C_o	=	46	µF
L_i	=	0	mH		L_o	=	2	µH

C_o and L_o pairs directly above/underneath each other may be used.

The maximum values for zone 1 group IIB are:

C_i	=	0	µF		C_o	=	79	µF
L_i	=	0	mH		L_o	=	20	µH

C_o and L_o pairs directly above/underneath each other may be used.

b) The maximum values for zone 2 group IIC are:

C_i	=	0	µF		C_o	=	130	µF
L_i	=	0	mH		L_o	=	2	µH

C_o and L_o pairs directly above/underneath each other may be used.

The maximum values for zone 2 group IIB are:

C_i	=	0	µF		C_o	=	160	µF
L_i	=	0	mH		L_o	=	20	µH

C_o and L_o pairs directly above/underneath each other may be used.

Reader WCR1 (X8) (connection voltage supply, X8.1-2):

U_i	=	11.4	V
I_i	=	200	mA
P_i	=	2.28	W
C_i	=	25	nF
L_i	=	0	mH

Reader WCR1 (power supply reader, X8.3-4):

U_o	=	5,88	V
I_o	=	200	mA
P_o	=	1.18	W

a) The maximum values for zone 1 group IIC are:

C_i	=	5.3	µF		C_o	=	27.7	37.7	µF
L_i	=	0	mH		L_o	=	2	1	µH

C_o and L_o pairs directly above/underneath each other may be used.

The maximum values for zone 1 group IIB are:

C_i	=	5.3	µF		C_o	=	55.7	94.7	µF
L_i	=	0	mH		L_o	=	20	10	µH

C_o and L_o pairs directly above/underneath each other may be used.

b) The maximum values for zone 2 group IIC are:

C_i	=	5.3	µF		C_o	=	80.7	664.7	µF
L_i	=	0	mH		L_o	=	2	1	µH

C_o and L_o pairs directly above/underneath each other may be used.

The maximum values for zone 2 group IIB are:

C_i	=	5.3	µF		C_o	=	114.7	234.7	µF
L_i	=	0	mH		L_o	=	20	10	µH

C_o and L_o pairs directly above/underneath each other may be used.

Reader WCR1 and WCR2 (signal input / output, X8.5-8):

U_i	=	15	V		U_o	=	5.88	V
I_i	=	500	mA		I_o	=	51	mA
P_i	=	2.5	W		P_o	=	75	mW

a) The maximum values for zone 1 group IIC are:

C_i	=	0	µF		C_o	=	34	µF
L_i	=	0	mH		L_o	=	2	µH

C_o and L_o pairs directly above/underneath each other may be used.

The maximum values for zone 1 group IIB are:

C_i	=	0	µF		C_o	=	63	µF
L_i	=	0	mH		L_o	=	20	µH

C_o and L_o pairs directly above/underneath each other may be used.

b) The maximum values for zone 2 group IIC are:

C_i	=	0	µF		C_o	=	87	µF
L_i	=	0	mH		L_o	=	2	µH

C_o and L_o pairs directly above/underneath each other may be used.

The maximum values for zone 2 group IIB are:

C_i	=	0	µF		C_o	=	130	µF
L_i	=	0	mH		L_o	=	20	µH

C_o and L_o pairs directly above/underneath each other may be used.

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PS2 interface (X9):

Connection for keyboard, mouse, trackball, joystick

U_o	=	5.88	V
I_o	=	200	mA
P_o	=	1.18	W

a) The maximum values for zone 1 group IIC are:

C_i	=	17.6	µF		C_o	=	15.4	25.4	µF
L_i	=	0	mH		L_o	=	2	1	µH

C_o and L_o pairs directly above/underneath each other may be used.

The maximum values for zone 1 group IIB are:

C_i	=	17.6	µF		C_o	=	10.4	20.4	43.4	82.4	µF
L_i	=	0	mH		L_o	=	100	50	20	10	µH

C_o and L_o pairs directly above/underneath each other may be used.

b) The maximum values for zone 2 group IIC are:

C_i	=	17.6	µF		C_o	=	68.4	652.4	µF
L_i	=	0	mH		L_o	=	2	1	µH

C_o and L_o pairs directly above/underneath each other may be used.

The maximum values for zone 2 group IIB are:

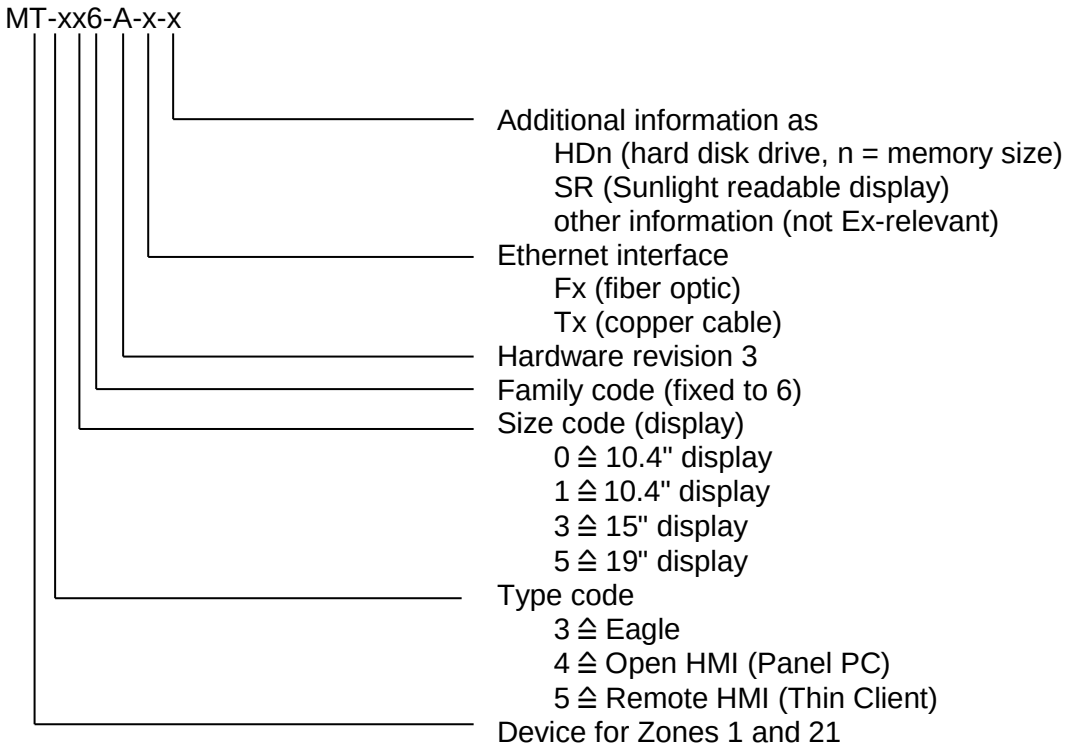
C_i	=	17.6	µF		C_o	=	33.4	53.4	102.4	222.4	µF
L_i	=	0	mH		L_o	=	100	50	20	10	µH

C_o and L_o pairs directly above/underneath each other may be used.

☞ Do **NOT** connect the optional external keyboard to live equipment !

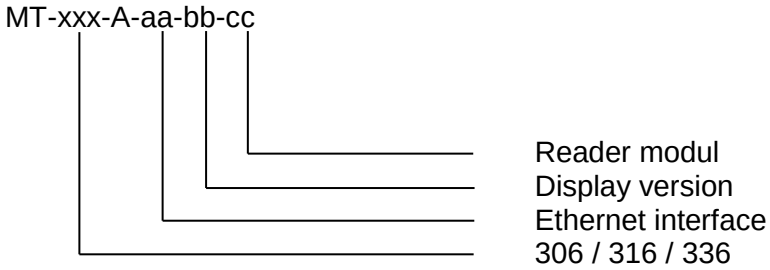
9 Type code

9.1 Certificate



9.2 Order variant

9.2.1 MT-3x6-A (EAGLE)



Order variant:

Classification product key	Description
	Type with
MT-3x6-A-**Fx**-bb-cc	Optical fiber Ethernet interface 100BaseFx (Ex op is)
MT-3x6-A-**Tx**-bb-cc	Copper Ethernet interface 10/100BaseTx (Ex-nA)
MT-3x6-A-aa-**TFT**-cc	TFT Display (Standard)
MT-3x6-A-aa-**SR**-cc	Sunlight readable Display 1000 cd/m² (only MT-336-A)
MT-3x6-A-aa-bb-**RSi1**	Plug-in module for reader with RS-232 interface, power supply via operator interface
MT-3x6-A-aa-bb-**RSi2**	Plug-in module for reader with RS-232 interface, power supply of the reader externally
MT-3x6-A-aa-bb-**WCR1**	Plug-in module for reader with Wiegand interface, power supply via SV 9143/10-114-200-xx
MT-3x6-A-aa-bb-**WCR2**	Plug-in module for reader with Wiegand interface, power supply of the reader externally

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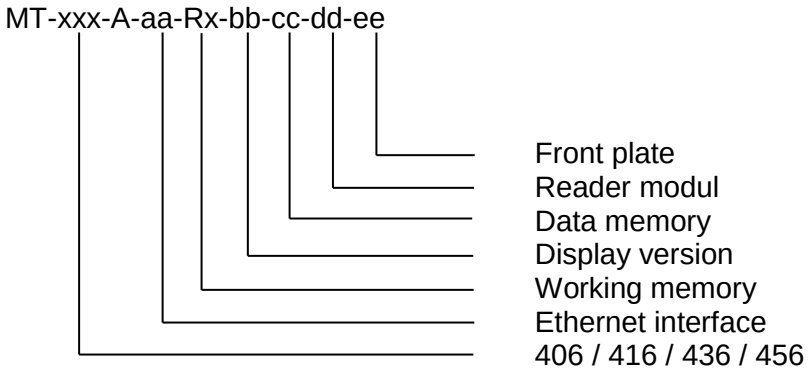
9.2.2 MT-4x6-A (Panel PC)

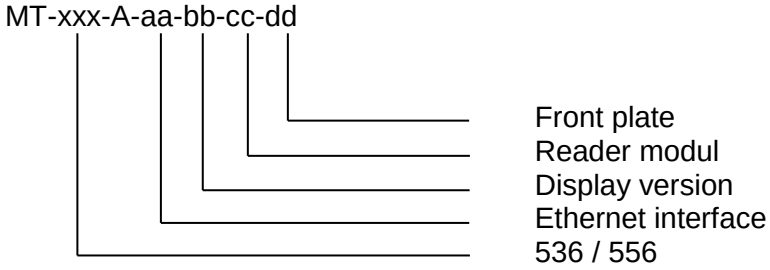


Order variant:

Classification product key	Description
	Type with
MT-4x6-A-**Fx**-Rx-bb-cc-dd-ee	Optical fiber Ethernet interface100BaseFx (Ex op is)
MT-4x6-A-**Tx**-Rx-bb-cc-dd-ee	Copper Ethernet interface 10/100BaseTx (Ex-nA)
MT-4x6-A-aa-**R1**-bb-cc-dd-ee	Working memory 1 GB
MT-4x6-A-aa-**R2**-bb-cc-dd-ee	Working memory 2 GB
MT-4x6-A-aa-Rx-**TFT**-bb-cc-dd-ee	TFT display (standard)
MT-4x6-A-aa-Rx-**SR**-bb-cc-dd-ee	Sunlight readable display 1000 cd/m² (MT-436-A only)
MT-4x6-A-aa-Rx-bb-**4GB**-dd-ee	4 GB Solid State Drive
MT-4x6-A-aa-Rx-bb-**16GB**-dd-ee	16 GB Solid State Drive
MT-4x6-A-aa-Rx-bb-**100GB**-dd-ee	100 GB hard disk (externaly- Exicom-SHD-xxx) *
MT-4x6-A-aa-Rx-bb-cc-**RSi1**-ee	Plug-in module for reader with RS-232 interface, power supply via operator interface
MT-4x6-A-aa-Rx-bb-cc-**RSi2**-ee	Plug-in module for reader with RS-232 interface, power supply of the reader externally
MT-4x6-A-aa-Rx-bb-cc-**WCR1**-ee	Plug-in module for reader with Wiegand interface, power supply via SV 9143/10-114-200-xx
MT-4x6-A-aa-Rx-bb-cc-**WCR2**-ee	Plug-in module for reader with Wiegand interface, power supply of the reader externally
MT-4x6-A-aa-Rx-bb-cc-dd-**PES**	Polyester front plate
MT-4x6-A-aa-Rx-bb-cc-dd-**VA**	Stainless steel front plate (436 and 456 only), **not** SR type

* ☞ The Exicom-SHD-xxx hard disk can only be used **instead** of a flash memory card (SSD), **not** in addition to it !

9.2.3 MT-5x6-A (Remote HMI Thin Client)



Order variant:

Classification product key	Description
	Type with
MT-536-A-**Fx**-bb-cc-dd	Optical fiber Ethernet interface 100BaseFx (Ex op is)
MT-536-A-**Tx**-bb-cc-dd	Copper Ethernet interface 10/100BaseTx (Ex-nA)
MT-536-A-aa-**TFT**-cc-dd	TFT display (standard)
MT-536-A-aa-**SR**-cc-dd	Sunlight readable display 1000 cd/m² (MT-536-A only)
MT-5x6-A-aa-bb-**RSi1**-dd	Plug-in module for reader with RS-232 interface, power supply via operator interface
MT-5x6-A-aa-bb-**RSi2**-dd	Plug-in module for reader with RS-232 interface, power supply of the reader externally
MT-5x6-A-aa-bb-**WCR1**-dd	Plug-in module for reader with Wiegand interface, power supply via SV 9143/10-114-200-xx
MT-5x6-A-aa-bb-**WCR2**-dd	Plug-in module for reader with Wiegand interface, power supply of the reader externally
MT-5x6-A-aa-bb-cc-**PES**	Polyester front plate
MT-5x6-A-aa-bb-cc-**VA**	Stainless steel front plate, **not** SR type

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10 Safety Advice

This chapter is a summary of the key safety measures. The summary is supplementary to existing rules which staff also have to study.
The safety of persons and equipment in hazardous areas depends on compliance with all relevant safety regulations. Thus, the installation and maintenance staff carry a particular responsibility, requiring precise knowledge of the applicable regulations and conditions.

10.1 Installation and operation

Please note the following when installing and operating the device:

- The national regulations for installation and assembly apply (e.g. EN/IEC 60079-14).
- The operator interface must only be switched on when it is closed.
- The installation must be compliant with any applicable regulations.
- After switching the operator interface off, wait for at least 1 minute before opening it.
- The safe maximum values of the connected field device(s) must correspond to the values listed on the data sheet or the EC type examination certificate.
- The operator interfaces may be installed in zones 2 or 22.
- When used in zone 2 and zone 22, intrinsically safe category 2 devices or energy-limited category 3 associated equipment may be connected to the intrinsically safe circuits.
- If category 2 equipment is connected to the intrinsically safe circuits in zone 1, Um must adhere to EN 60079-11 : 2007, section 3.16 when connecting the power supply and the non-energy-limited circuites of the MT-xx6-A.
- For the maximum connectable L and C values of the intrinsically safe circuits, the associated (above/underneath each other) pairs of values must be applied.
- National safety and accident prevention rules.
- Generally accepted technical rules.
- Safety instructions contained in these operating instructions.
- Any damage may compromise the explosion protection !

Use the device for its intended purpose only (see "Device Function").
Incorrect or unauthorized use and non-compliance with the instructions in this manual will void any warranty on our part.
No changes to the device that compromise its explosion protection are permitted !
The device may only be installed and operated in an undamaged, dry and clean condition !

10.2 Cautionary note

Caution:
This is an EN 55022 Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

10.3 Special conditions

The fronts of the operator interfaces with a sunlight readable display (type code includes “SR”) may be cleaned with a damp cloth only.

11 Installation

11.1 General information

Electrical plants are subject to certain regulations concerning installation and operation (e.g. RL 1999/92/EC, RL 94/9/EC and IEC/EN 60079-14).

It is the responsibility of the operators of electrical installations in hazardous environments to ensure that the equipment is kept in proper condition, is operated according to instructions and that maintenance and repairs are carried out.

11.2 MT-xx6-A

- The operator interfaces may be installed in zones 2 or 22. The circuits must be installed according to applicable regulations.
- The PE connection part of the operator interface located at the back of the housing is internally connected with the GND supply cable (X1 pins 3 and 4).
- The operator interfaces can be mounted and operated in any position. Sufficient air circulation must be ensured, however, so that the maximum operating temperature is not exceeded.
- The operator interface's front should be protected by a canopy against permanent exposure to UV light. This increases the front membrane's lifespan. The canopy **MUST NOT** be too close to the front plate and sufficient air circulation must be ensured.
- The MT-4x6-A and MT-5x6-A devices may be operated at +55°C **ONLY FOR SHORT PERIODS** (maximum 5 h) at a time.

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11.3 Installation via USB-interfaces

Installation of software on the operator interfaces via the USB-interfaces:

11.3.1 Software installation using a USB Memory Stick

You may only use USB memory sticks permitted for use by R. STAHL HMI Systems GmbH. These USB memory sticks are below and in general referred to by R. STAHL HMI Systems GmbH as "USB(i) Drives". Data may only be copied onto the operator interfaces and software may only be installed with these USB Drives.

- In hazardous areas you may only use I.S. certified USB Drives supplied by R. STAHL HMI Systems GmbH.
- In an industrial area, a permitted, non-explosion proof memory stick may be connected to the I.S. USB interface of the operator interface after having been connected to any PC.
- R. STAHL HMI Systems GmbH's USB(i) drives may also be connected to non-intrinsically safe interfaces, from where they may be used with operator interfaces of the MT-xx6-A series.

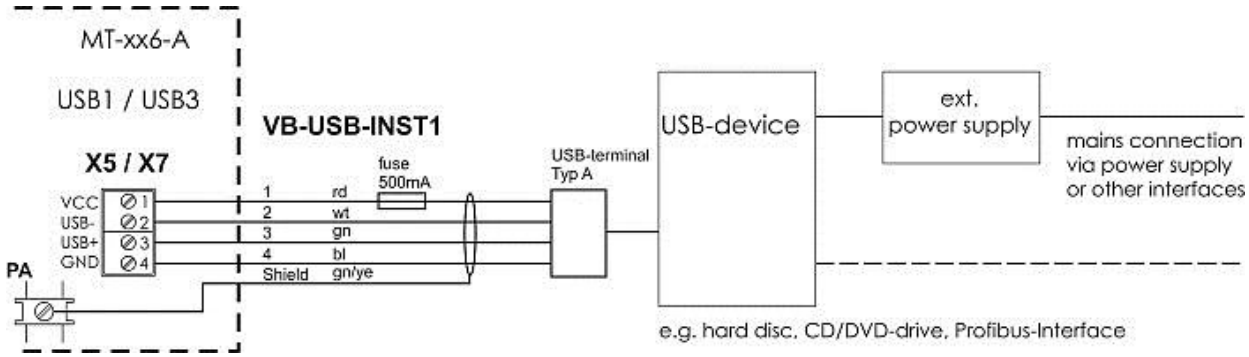
If devices are connected to the I.S. USB interface that have not been approved by R. STAHL HMI Systems GmbH, protective elements may become damaged, thus compromising the intrinsic safety of the interfaces.
In this case R. STAHL HMI Systems can no longer guarantee the intrinsic safety of the device !

11.3.2 Software installation with external USB devices

☞ Not applicable to MT-5x6-A

Software may be installed with the aid of any external USB devices subject to the following conditions:

- The software is installed in the safe area.
- The USB devices are connected to the USB interfaces USB1 or USB3 (X5 or X7) with the VB-USB-INST1 connection cable.



Connection diagram with VB-USB-INST1 (hard disk, CD/DVD with power supply)

11.4 USB interfaces

The MT-xx6-A device series have 4 USB interface channels.

- USB0 at X4 for the internal connection of a USB Drive.
- USB1 at X5 for the connection of external USB devices.
- USB2 at X6 for the connection of an external USB Drive.
- USB3 at X7 for the connection of external USB devices.

📖 The connection diagram for the MT-xx6-A interfaces can be found in chapter 13.2 connections.

11.4.1 I.S. USB interfaces USB0, USB2

The USB0 and USB2 interfaces (X4 and X6) are intended for the internal or external connection of USBi Drives.

The maximum value for the joint power supply of USB0 and USB2 is 500 mA.

11.4.2 Ex-nA USB interfaces USB1, USB3

The USB1 and USB3 interfaces (X5 and X7) are intended for the connection of external USB devices.

The maximum value for the joint power supply of USB1 and USB3 is 500 mA.

11.4.2.1 Connection variations for Ex-nA USB interfaces

The two Ex-nA USB interfaces have an identical structure.

⚠ If intrinsically safe devices are connected to the Ex-nA USB interfaces of the MT-xx6-A operator interfaces, R. STAHL Systems GmbH cannot guarantee that the intrinsic safety of these devices will continue to apply.

The following versions are possible:

1. If a USB device that is not connected to the mains is connected, voltage can be supplied from the internal power supply (terminal 1).
2. If a USB device that is connected to the mains is connected, the internal power supply (terminal 1) must not be connected. The power must be supplied from an external device.

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11.4.2.2 Connection terminal

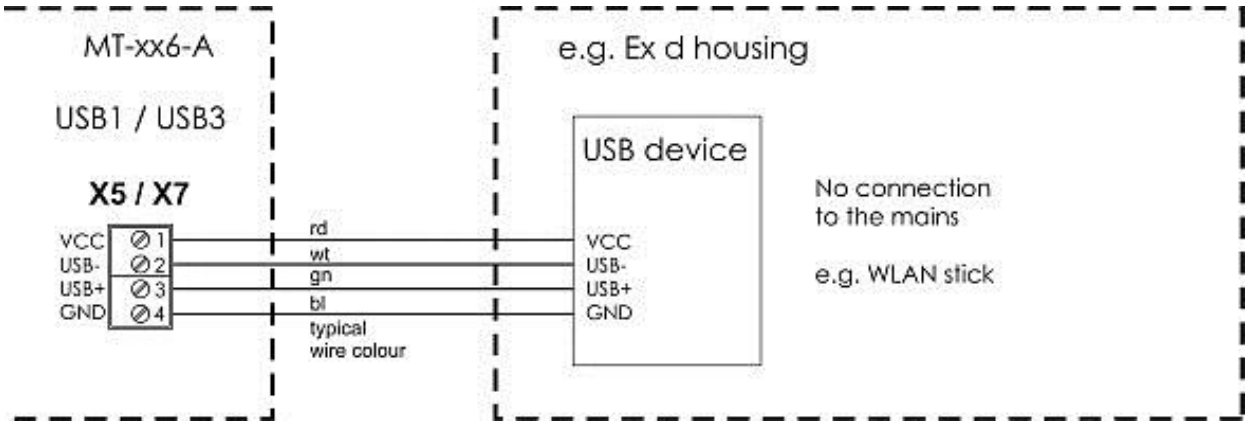
Flexible cables with a cross section of 0.2 – 2.5 mm² can be used.

The maximum cable length for the connection with the USB interfaces (X5 and X7) is 2.5 m.

The insulation of the wire must reach right up to the terminal body.

11.4.2.2.1 Type 1 connection version

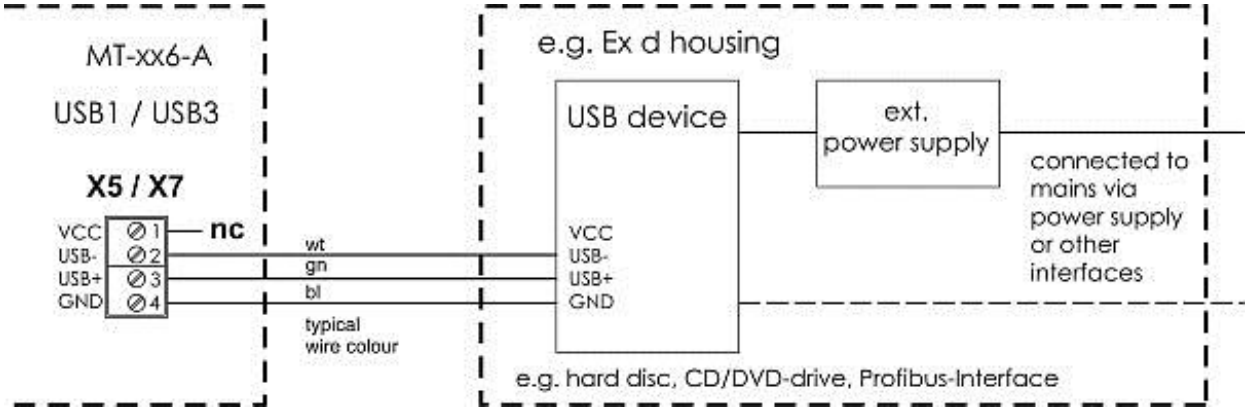
- The USB device does not require an external power supply as it uses less than 500 mA.
- No connection to the mains via other interfaces, e.g. WLAN stick.



Type 1 connection diagram (e.g. WLAN stick)

11.4.2.2.2 Type 2 connection version

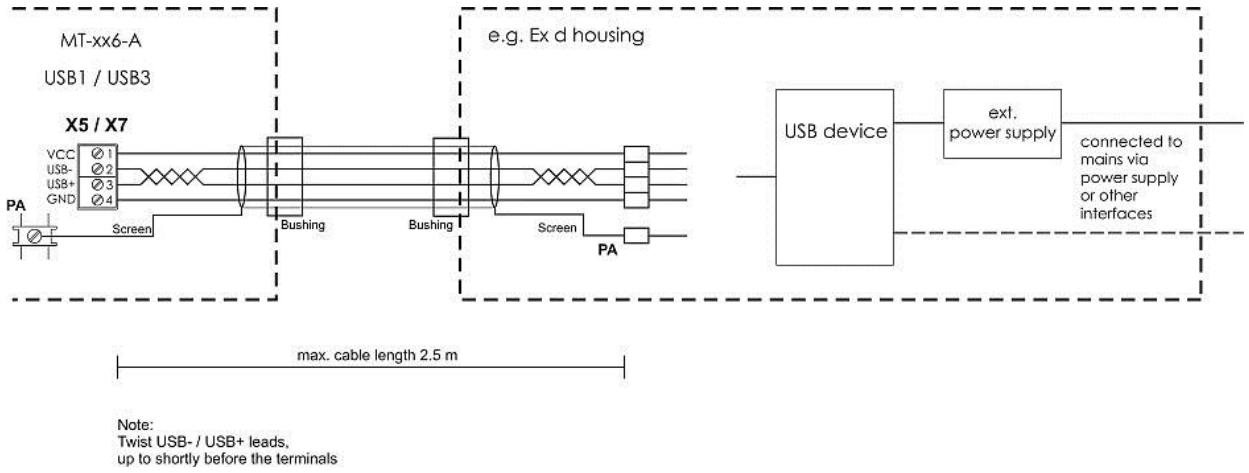
- The USB device does require an external power supply to function because it uses over 500 mA (e.g. hard disks, CD/DVD drives).
- The USB device is connected to the mains via other interfaces (e.g. USB/serial converter, USB-Profibus interface).



Type 2 connection diagram (e.g. hard disk, CD/DVD with power supply)

11.4.2.2.3 Type 3 connection version

- The USB device does require an external power supply to function because it uses over 500 mA (e.g. hard disks, CD/DVD drives).
- The USB device is connected to the mains via other interfaces (e.g. USB/serial converter, USB-Profibus interface).
- The USB device needs the VCC connection of the operator interface (internal supply – terminal 1) to function.



Type 3 connection diagram (any USB device with power supply)

12 Assembly and disassembly

12.1 General information

Assembly and disassembly are subject to general technical rules. Additional, specific safety regulations apply to electronic and pneumatic installations.

12.2 Cut-out MT-xx6-A

Make a cut-out with the following dimensions:

Operator interface	Width	Height	Depth of cut-out	Material thickness
MT-x06-A	385.5 ± 0.5 mm	257.5 ± 0.5 mm	150 mm	up to 8 mm
MT-x16-A	359.5 ± 0.5 mm	257.5 ± 0.5 mm	150 mm	up to 8 mm
MT-x36-A	427.5 ± 0.5 mm	327.5 ± 0.5 mm	165 mm	up to 8 mm
MT-x56-A	522,5 ± 0,5 mm	412,5 ± 0,5 mm	165 mm	up to 8 mm

13 Operation

13.1 General information

When operating the devices, particular care shall be taken that:

- the operator interface has been properly installed according to instructions,
- the device is undamaged,
- the terminal compartment is clean,
- all screws are tightened fast,
- before switching the operator interface on, its external PE terminal is properly connected to the equipotential bonding system at its place of use,
- the cover of the terminal compartment is completely closed.

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13.2 Connections

Terminal	Pin	Definition	Connection
X1	1	Power supply operator interface +24 VDC	Power supply of the operator interface
	2	Power supply operator interface +24 VDC	
	3	Power supply operator interface GND	
	4	Power supply operator interface GND	
X2	1	TxD-b	Serial COM1 interface RS-422/485
	2	TxD-a	
	3	RxD-b	
	4	RxD-a	
	5	TxD-b'	
	6	TxD-a'	
	7	RxD-b'	
	8	RxD-a'	
	9	TxD	Serial COM1 interface RS-232
	10	RxD	
	11	RTS/	
	12	CTS/	
	13	GND	
X3	1	Line Out right	Audio
	2	GND	
	3	Line Out left	
X4		USB interface, connection type A	USB0
X5	1	VCC	USB1
	2	USB -	
	3	USB +	
	4	GND	
X6	1	VCC	USB2
	2	USB -	
	3	USB +	
	4	GND	
	5	GND	
X7	1	VCC	USB3
	2	USB -	
	3	USB +	
	4	GND	
X8	0	+U_INT1	Reader interface I.S.
	1	0V	
	2	+U_EX1	
	3	GND	
	4	+U_RD	
	5	Signal 1	
	6	Signal 2	
	7	Signal 3	
	8	Signal 4	
	9	+U_EX1 (out)	
X9	1	VCC	PS2 interface * for external keyboard / mouse
	2	KBDAT	
	3	KBCLK	
	4	MSDAT	
	5	MSCLK	
	6	GND	

X10	1	Optical fiber connection type SC	Ethernet optical fiber interface **
X11	1	TxD (+)	Ethernet copper Connection **
	2	TxD (-)	
	3	RxD (+)	
	4	RxD (-)	

☞ Please also note that the COM interface may only be physically connected once ! Power is supplied either with a physical RS-232 or an RS-422/485 connection.

☞ * Do NOT connect the optional external keyboard to live equipment !

☞ ** Please note that the Ethernet connection is either for an optical fibre connection (X10) or for a copper connection (X11), depending on the version ordered !
The optical fiber connection requires a multimode optical fiber cable with 62.5 µm core diameter and 125 µm external diameter.
Copper wires with cross sections of between 0.2 mm² (AWG 24) and 1.5 mm² (AWG 14) may be connected to any of the terminals of the operator interfaces.
Which cable cross sections are chosen should be decided on the basis of relevant regulations, such as DIN VDE 0298. Factors that might require a larger cross section, such as current, increased temperatures, cable bundling, etc. must also be taken into account !

13.2.1 Dip switch settings S3 and S4

Switch	Position	Interface	Function
S3-1	OFF	COM1 RS-422/485	No bus terminator resistor set
	ON		Bus terminator resistor TxD line
S3-2	OFF		No bus terminator resistor set
	ON		Bus terminator resistor RxD line

S4-1	S4-2	S4-3	Interface	Keying
0	0	0	RS-422	Automatic keying
0	1	0		Keying always on
0	0	1		Keying enabled by SW
0	1	1		Driver in idle mode
1	0	0	RS-485	Automatic keying
1	1	0		Status not permitted !!!
1	0	1		Keying enabled by SW
1	1	1		Driver in idle mode
S4-4 *	OFF		Touch *	Touch switched off
	ON			Touch switched on

* To switch off the touch via the dip switch S4-4 is at the moment not possible !

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13.2.2 Status LEDs

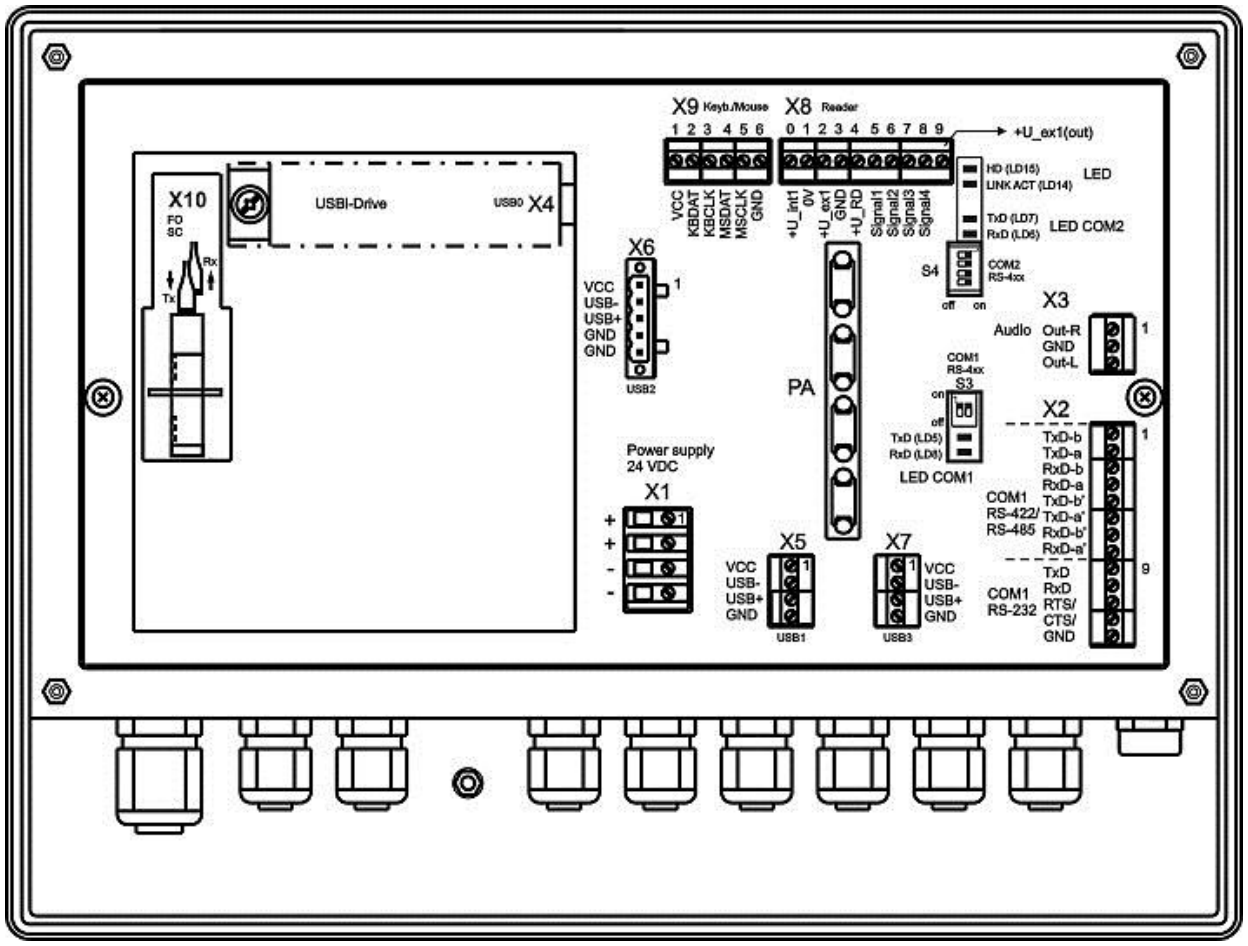
The status of the respective LEDs at the operator interfaces indicates the activity of the corresponding data lines.

⚠ In hazardous areas the operator interface must not be operated without the housing lid ! The status LEDs can therefore only be observed at the first start-up or in safe areas.

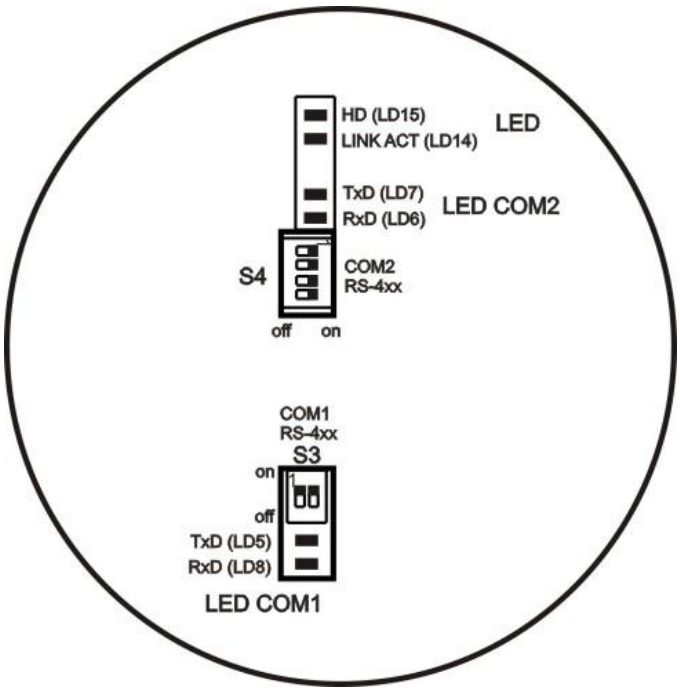
13.2.2.1 LEDs

Definition	Colour	Name	Description
LD5	green	COM1 TxD	Activity on COM1: sending, LED flashing
LD8	yellow	COM1 RxD	Activity on COM1: receiving, LED flashing
LD7	green	COM2 TxD	Activity on COM2: sending, LED flashing
LD6	yellow	COM2 RxD	Activity on COM2: receiving, LED flashing
LD14	yellow	LINK ACT	Ethernet link established, LED always on Activity on Ethernet link, LED flashing
LD15	green	HD	Access to system disk (Solid State, HDD), LED flashing (only for MT-4xx-A devices)

Back view of MT-xx6-A device:



LED section at MT-xx6-A device:



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13.3 Connection of Readers

Different types of readers can be connected to the operator interfaces. For this, there are two interface connection versions (serial RS-232 and Wiegand) and four connection diagrams.

⚠ Please note that the Ex-connection values of the reader must match the safety-relevant values of the interface !

🕮 For the exact wiring diagram of each individual reader type, please refer to the actual reader documentation or to the Hardware Manual.

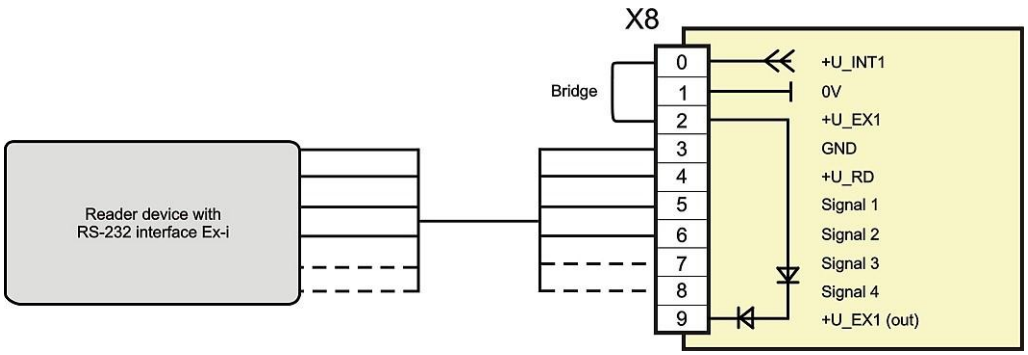
Operator interfaces of the Panel PC and Thin Client series require an additional software (keyboard wedge) to transfer the data from the reader into the required application. This software is not part of the delivery.

13.3.1 Serial connection versions

Only readers with a serial RS-232 interface can be connected.

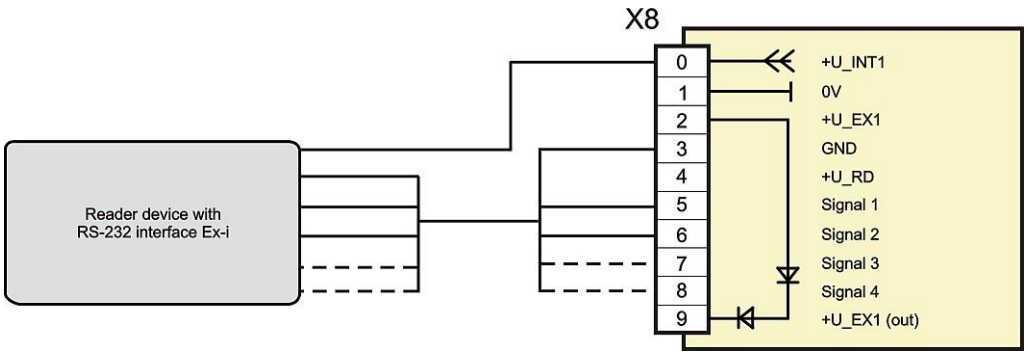
13.3.1.1 Type RSi1 connection version 1

With the RSi1 connection version, the reader is supplied with power via the operator interface. In version 1, a maximum of 5.36 V and 220 mA are available for the reader (e.g. the SK-200 barcode reader).



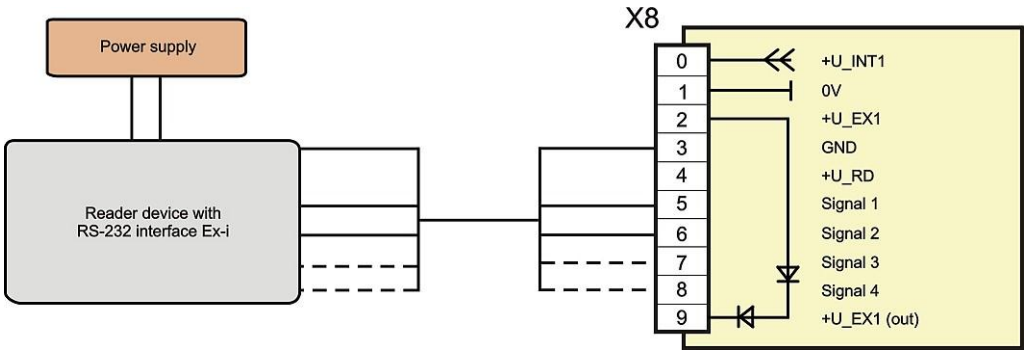
13.3.1.2 Type RSi1 connection version 2

In version 2, a maximum of 10.4 V and 220 mA are available for the reader (e.g. the RFIDi-RDR-1-xxx chipcard reader).



13.3.1.3 Type RSi2 connection version

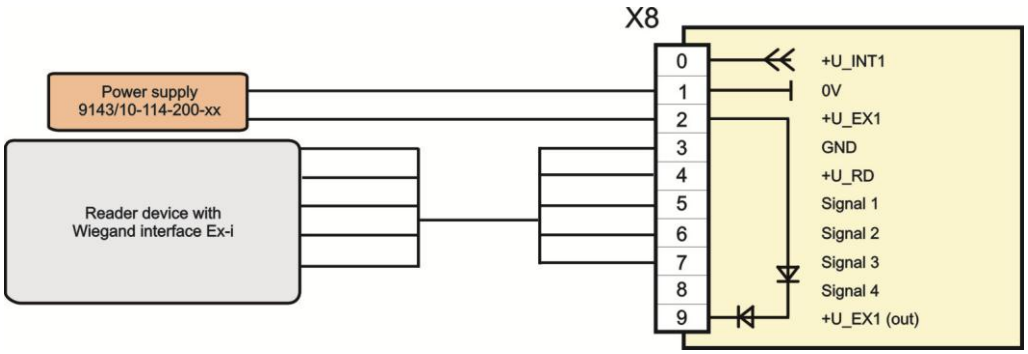
With the RSi2 connection version, the reader itself is supplied with power from an external source. The maximum values of the reader apply in this case.



13.3.2 Wiegand connection versions

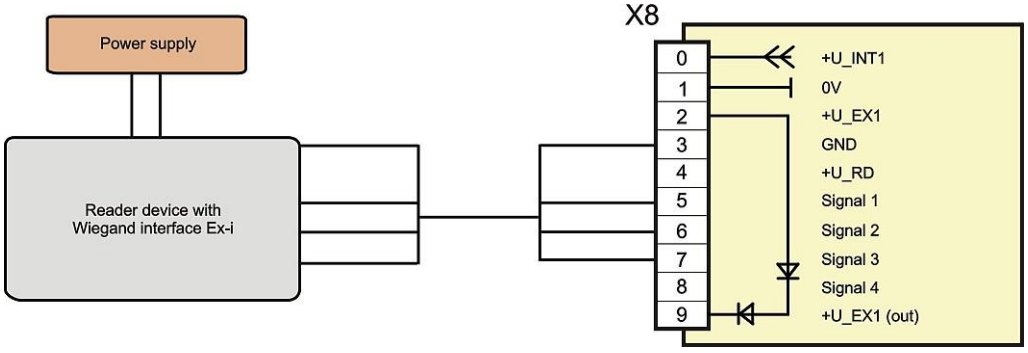
13.3.2.1 Type WCR1 connection version

With the WCR1 connection version, the reader is supplied with power via the operator interface. For the actual power supply, the 9143/10-114-200-xx power supply must be used. The maximum supply for the reader is 5.88 V and 200 mA.



13.3.2.2 Type WCR2 connection version

With the WCR2 connection version, the reader itself is supplied with power from an external source. The maximum values of the reader apply in this case.



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14 Exicom-SHD-xxx hard disk

The optional Exicom-SHD-xxx hard disk can be fitted inside the MT-4x6-A operator interfaces.

☞ The Exicom-SHD-xxx hard disk can only be used **instead** of a flash memory card (SSD), **not** in addition to it !

14.1 Installation of hard disk

The Exicom-SHD-xxx hard disk is mounted by R. STAHL HMI Systems GmbH during the production of its operator interfaces. It is **NOT** possible to install the hard disks at a later date !

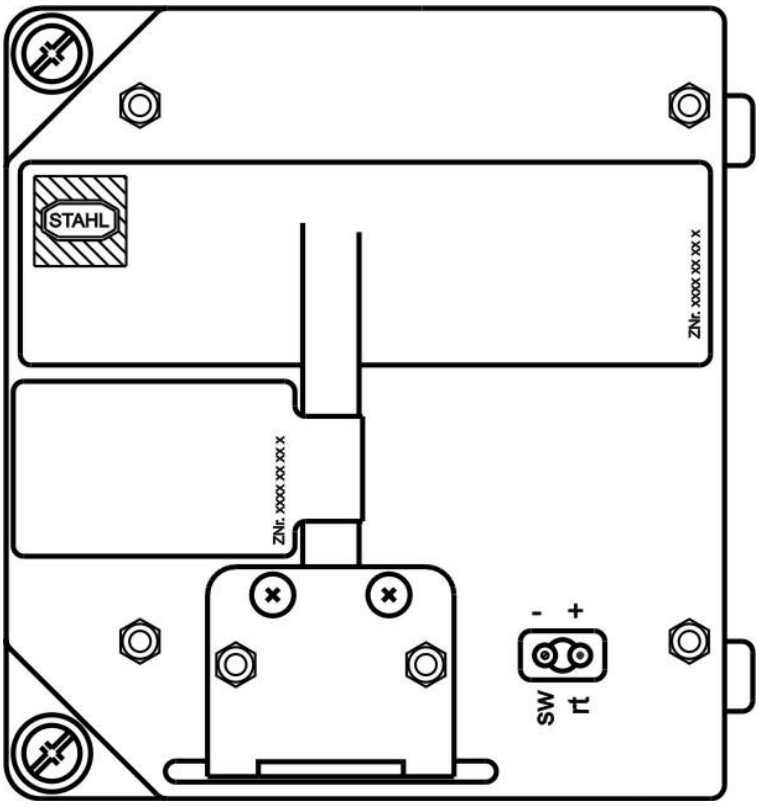
⚠ Installation of the Exicom-SHD-xxx hard disk into the MT-4x6-A operator interfaces reduces the minimum operating temperature to -20°C !
The minimum temperature for the front remains -30°C.

⚠ The Exicom-SHD-xxx is incorporated into the operator interface's PA by means of two fixing screws.
The fixing screws must be **FIRMLY** affixed to the housing of the operator interface to ensure this.
The **SAFE** integration of the Exicom-SHD-xxx hard disk into the operator interface's PA is guaranteed due to its factory-mounting by R. STAHL HMI Systems GmbH.

14.1.1 Mechanical dimensions

Hard disk housing (l x w x h, in mm) 113 x 92 x 31

Top view:



14.2 Connections

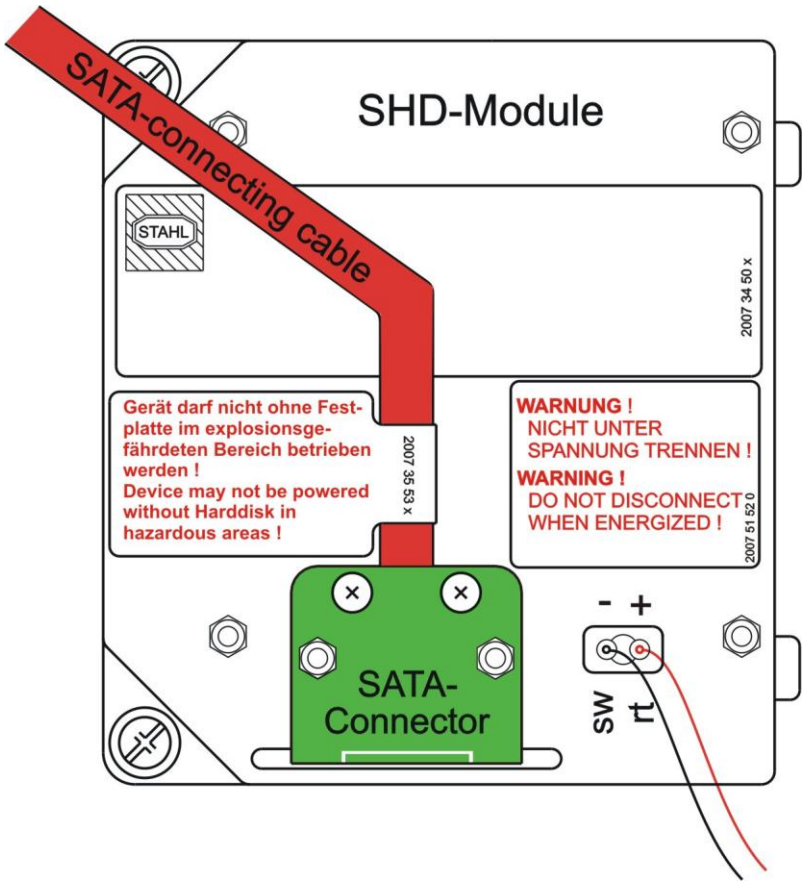
The Exicom-SHD-xxx hard disk is supplied with 24 VDC.
The two connection wires intended for the purpose can be connected to the free contacts of the operator interface's X1 terminal (operator interface supply). The red cable (+ wire) is connected to the + pin (pin 2) and the black cable (- wire) is connected to the – (GND) pin (pin 3) of X1.

The data cable of the hard disk is connected with the S-ATA plug to the associated 11-pin connector which protrudes from the encapsulation.

14.2.1 Safety advice

⚠ **DO NOT** operate the MT-4x6-A operator interfaces **WITHOUT** the **HARD DISK** or if the SATA connection cable is **DISCONNECTED** !
A warning notice to this effect is attached to the SATA connection cable (see illustration).

⚠ While the operator interface is switched on, the SATA connector and the power supply of the Exicom-SHD-xxx hard disk **MUST NOT** be disconnected.
A warning notice to this effect is attached to the Exicom-SHD-xxx hard disk (see illustration).



14.3 Hard disk replacement

The Exicom-SHD-xxx hard disk may be replaced. However, only specially trained staff with expertise in explosion-protection may carry out such a replacement.

📖 For information on how to replace the hard disk, please refer to the Operating Instructions "OI_Harddisk_SHD".

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15 Maintenance, service

Associated equipment is subject to maintenance, service and testing according to guidelines 1999/92/EC, IEC 60079-19, EN 60079-17 and BetrSichVer (Betriebssicherheitsverordnung - Occupational Safety and Health) !

Because the transmission of the devices remains reliable and stable over long periods of time, regular adjustments are not required.
The following principles apply to repairs *, spare parts purchase* or exchange of parts * (where this can be done by the user !):

- Only original parts provided by the manufacturer must be used.
- Fuses may only be replaced by equivalent fuse types.

⚠ * Please also note section Troubleshooting !

If the MT-xx6-A operator interfaces are stored for more than 6 months, they should be operated every six months for at least one hour at room temperature (20°C ± 5°C).

The MT-xx6-A series operator interfaces are maintenance-free across their entire lifespan.

System maintenance should focus on the following:

a. Seal wear
b. Display damage
c. All screws are tightened fast
d. All cables and lines are properly connected and undamaged

15.1 Servicing

In accordance with IEC 60079-19 and EN 60079-17, operators of electric plants in hazardous areas are obliged to have them serviced by qualified electricians.

15.2 Saving data with MT-3x6-A

All online data is stored on the internal flash card and are therefore also available after the device has been switched off for a long time.
According to the current state-of-the-art the flash cards retain stored data for about 10 years.

15.3 Time function

Does not apply to MT-5x6-A:
When the MT-3x6-A and MT-4x6-A operator interfaces are switched off, their clock function is maintained by a battery and a capacitor. As long as the battery is intact, the clock function is maintained. Once the battery fails, the capacitor takes over and maintains the clock function for about four days. If the operator interface is switched on after a longer interval than that, the time and date have to be re-set manually or via a connected system.

16 Troubleshooting

Devices operated in hazardous areas must not be modified. Repairs may only be carried out by qualified, authorized staff specially trained for this purpose.

☞ Repairs may only be carried out by specially trained staff who are familiar with all basic conditions of the applicable user regulations and – if requested – have been authorized by the manufacturer.

17 Disposal

Disposal of packaging and used parts is subject to regulations valid in whichever country the device has been installed.
The disposal of devices sold after August 13th, 2005, and installed in countries under the jurisdiction of the EU is governed by directive 2002/96/EC on waste electrical and electronic equipment (WEEE). Under this directive, operator interfaces are listed in category 9 (monitoring and control instruments).
We shall take back our devices according to our General Terms and Conditions.

17.1.1 ROHS directive 2002/95/EC

The prohibition of hazardous substances as detailed in directive 2002/95/EC (ROHS) does not apply to electronic equipment of categories 8 and 9, and is therefore not applicable to the equipment described in these operating instructions.

17.1.2 China ROHS labelling

According to new Chinese legislation in force since 01.03.2007, all devices containing hazardous substances must be labeled accordingly.

For our operator interfaces, the following conditions apply:

Names and contents of toxic or hazardous substances or elements:

Part	**Toxic or hazardous substances and elements**					
Name	**Lead (Pb)**	**Mercury (Hg)**	**Cadmium (Cd)**	**Hexavalent Chromium (Cr (VI))**	**Polybrominated Biphenyls (PBB)**	**Polybrominated diphenyl ethers (PBDE)**
Housing	O	O	O	O	O	O
Display	O	O	O	O	O	O
all PCBs	**X**	O	O	O	O	O
Miscellaneous	O	O	O	O	O	O

O Indicates that this toxic or hazardous substance contained in all of the homogeneous materials for this part is below the limit requirements in SJ/T11363-2006.

X Indicates that this toxic or hazardous substance contained in at least one of the homogeneous materials for this part is below the limit requirements in SJ/T11363-2006.

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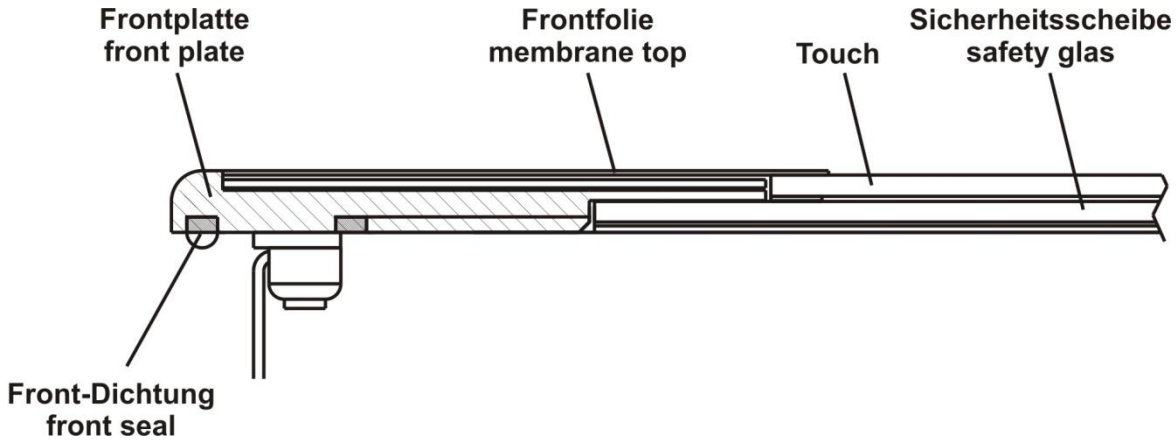
18 Front panel resistance

This section contains information on the resistance of the operator interfaces to various environmental factors. These have an impact on the mechanical, thermal and chemical stability of the operator interfaces.

The resistance to chemicals was tested according to DIN 42115 Part 2, i.e. the stability over 24 hours without visible changes to the operator interfaces.

18.1 Design

Structure:



18.2 Materials

Application	Material
Membrane top	Polyester or stainless steel
Touch screen	Polyester
Display window	Safety glas
Front plate	Aluminum
Housing	Stainless steel
Front panel seal	Polyurethane
Back cover seal (not visible)	Silicone

18.3 Material properties

- ☞ The selection of chemicals listed here is not exhaustive.
- ☞ More comprehensive lists can be obtained for further information from R. STAHL HMI Systems GmbH.
- ☞ Because of the numerous chemical substances available on the market, these lists can only represent a selection.
- ☞ Further information can also be found on the following homepage: http://macdermidautotype.com/

18.3.1 Entire device

☞ The chemical substances and resistances are the lowest common denominator of all materials used in the operator interface.
Thus, the entire device has a somewhat lower chemical resistance than the individual materials.

Property	Chemical material class / group	Chemical substances	Test method
Chemical • Chemical resistance	Alcohols	Glycerin	DIN 42115 DIN 53461
	Aldehydes	Formaldehyde 37--42%	
	Household chemicals	Detergents	
	Oils	Petrol	
Property	**Resistance**		**Test method**
Mechanical • Service life after imprint • Operating force • MIT folding resistance	5 million touches max. 50 N >20000 folding operations		Autotype method ASTM D2176
Thermal • Dimensional • Dimension stability	Max. 0.2% at 120° longitudinal Typically 0.1%		Autotype method

18.3.2 Membrane top (Polyester)

Property	Chemical material class / group	Chemical substances	Test method
Chemical • Chemical resistance	Alcohols	1,3 Butanediol 1,4 Butanediol Cyclohexanol Diacetone alcohol Ethanol Glycol Glycerol Isopropyl alcohol Methanol Neopentyl glycol Octanol 1,2 Propylene glycol Triacetin Dowandol DRM/PM	DIN 42115 DIN 53 461 Oder ASTM-F-1598-95
	Aldehydes	Acetaldehyde Formaldehyde 37--42%	
	Amines	Ammonia < 2%	
	Esters	Amyl acetate Ethylacetate N-Butyl acetate	

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Ethers	1.1.1. Trichloroethane Ether Dioxane Diethyl ether 2-Methyltetrahydrofuran (2-ME-THF)
Aromatic hydrocarbons	Benzene Toluene Xylene Paint thinner (white spirit)
Ketones	Acetone Methyl ethyl ketone Cyclohexanone Methyl isobutyl ketone (MIBK) Isophorone
Diluted acids	Formic acid <50% Acetic acid < 5% Phosphoric acid <30% Hydrochloric acid <10% Nitric acid <10% Trichloroacetic acid <50% Sulfuric acid <30%
Diluted alkaloids (bases)	Caustic soda <40%
Household chemicals	Ajax Ariel Domestos Downey Fantastic Formula 409 Gumption Jet Dry Lenor Persil Tenside Top Jop Vim Vortex Washing powder Fabric conditioner Whis Windex
Oils	Petrol Drilling muds Braking fluid Decon foam Diesel oil Varnish Keroflux Paraffin oil Castor oil Silicone oil Solvent naphta Mineral turpentine Kerosene

	No specific material class	Acetonitrile Alkali carbonate Dichromates Potassium dichromate Caustic soda <20% Dibutyl phthalate Dioctyl phthalate Iron II chloride ($FeCl_2$) Iron II chloride ($FeCl_3$) Haloalkanes Potassium soap Potassium hydroxide <30% Sodium bisulfate Tetrachloroethylene Salt water Trichloroethylene Water Hydrogen peroxide >25%	

Property	**Resistance**	**Test method**
Mechanic (keyboard) • Service life after imprint • Operating force • MIT folding resistance	 5 million touches max. 50 N >20000 folding operations	 Autotype method ASTM D2176
Mechanic (touch screen) • point activation	 1 million activations at any single point	 3M method
Thermal • Dimensional • Dimension stability	 Max. 0.2% at 120° longitudinal Typically 0.1%	 Autotype method

18.3.3 Touch screen

Property	**Chemical material class / group**	**Chemical substances**	**Test method**
Chemical • Chemical resistance	(see front membrane)	(see front membrane)	(see front membrane)
Property	**Resistance**		**Test method**
Mechanical • Service life after imprint • MIT folding resistance	(see front membrane)		(see front membrane)
Thermal • Dimensional • Dimension stability	(see front membrane)		(see front membrane)

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18.3.4 Front panel seal

Property	Chemical material class / group	Chemical substances	Test method
Chemical • Chemical resistance	Alcohols	Glycerol	DIN 53461
	Aldehydes	Formaldehyde	
	Ketones	Acetone	
	Household chemicals	Detergents Soap suds	
	Oils	Petrol Diesel oil Heizöl Hydrauliköl Leinöl	
Property	**Resistance**		**Test method**
Mechanical	(No information available at present)		
Thermal • Installation area	-30 to 80°C		DIN 53461

18.3.5 Rückdeckeldichtung

Property	Chemical material class / group	Chemical substances	Test method
Chemical • Chemical resistance	Alcohols	Methanol Glycerol	DIN 53461
	Aldehydes	Formaldehyde	
	Amines	Ammonia	
	Diluted acids	Sulfuric acid 25%	
	Household chemicals	Detergents Soap suds	
	Oils	Petrol Braking fluid Mineral oils Engine oils Axle grease / lube oil	
Property	**Resistance**		**Test method**
Mechanical	(No information available at present)		
Thermal • Installation area	-60 to 200°C		DIN 53461

19 General Information

The General Information below **ONLY** applies to the Eagle and Panel PC series of operator interfaces, and **NOT** to the Thin Client series.

19.1 Keyboard features

☞ Pressing two keys at once (e.g. F1 + F7) is not supported by the operator interfaces !
In such a case, the system considers the key that was pressed first as "active" and implements the associated functions and / or key bit functions !
The key pressed second is ignored.

☞ Pressing any three of the following keys at the same time has the same effect as pressing Ctrl + Alt + Del !
The keys are: F1, F2, F7 and F8.

MT-306-A only:

☞ The S1 – S10 softkeys can **NOT** be used in combination with Shift / Alt / Ctrl !
The system will only execute the original key command.

MT-406-A only:

☞ Pressing the S1 – S10 softkeys on the MT-406-A has the same effect as pressing the numerical keys 0 – 9.

☞ As an alternative, you may also allocate the Shift + F1 – Shift + F10 functions to the S1 – S10 keys.

If this is required, it must be stated when ordering, as it can only be done by the manufacturer **before delivery**.

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19.2 MT-4x6-A (Panel PC)

19.2.1 Licensing issues

The Panel PC series devices are fully pre-installed with the Windows XP Embedded, Windows XP Professional or Windows 7 Ultimate operating systems.
The license sticker is affixed on the back of the operator interface, next to the type plate.
Please note that according to the license issued for Windows XP Embedded the application of this system as an Office PC is not permitted.

19.2.2 Recovery Stick

☞ To restore your Panel PC device to its original state you will need a Recovery Stick, which is available as an optional extra. This recovery stick (USB-drive, also available intrinsically safe) contains the factory image, with which the system can be restored to delivery status within a very short time.
Please note that you can restore the operator interfaces to their original state only with the aid of the Recovery Stick.

☞ As an option, the recovery stick can also contain a backup software, with which you can back up your own device configuration.

19.2.3 Back-up

☞ Please note that it is the sole responsibility of the operator to generate a back-up of the operator interfaces and their overall function.

☞ We strongly recommend such a back-up to be stored on an external storage medium (USB stick / recovery stick, CD, DVD or similar) or on the company network.

19.2.4 Initial start-up

19.2.4.1 Initial start-up XP Pro/WIN 7

☞ When the Panel PC devices are run for the first time with the Windows XP Professional or Windows 7 Ultimate operating systems, this requires a keyboard that must be connected via the VB-USB-ISNT1 cable included in the delivery !
See also: 🕮 Software installation with external USB devices

19.2.4.2 Initial start-up XP Embedded

When the device is started for the first time, a Wizard starts where users have to select certain settings.
Please follow the instructions of the Wizard carefully.

🕮 For further information regarding this Wizard please refer to the OpenHMI_help_en.chm help file in the "STAHL" folder on the device or on the CD/DVD that is included in the delivery.

19.2.5 Switching off/closing down

☞ The Microsoft Windows operating system stores key data in the main memory, regardless of the application, and has to store this data on the hard disk before the PC / operator interface is switched off.

☞ It is therefore important for the safe and correct operation that the operator interface is closed down properly (see illustration below) and **NOT** simply switched off.

⚠ Otherwise the existing image of the device may be damaged, rendering the operator interface non-functioning.

After the data has been stored, Windows informs the user that the device can now be switched off.

⚠ Only switch off the device once you have received this message.

19.2.5.1 Note on XP Embedded

When using the Windows XP Embedded operating system on the Panel PC series devices, the C:\ system drive can be protected from unauthorised writing.

☞ This is **NOT** the case with Windows XP Professional and Windows 7 Ultimate !

📖 For further information regarding this Write Protection, please refer to the OpenHMI_help_en.chm help file in the "STAHL" folder on the device or on the CD/DVD that is included in the delivery.

Recommendation:
In the case of applications that require constant writing into memory, R. STAHL HMI systems recommends you use external storage media (USB sticks, network servers) for these write processes.

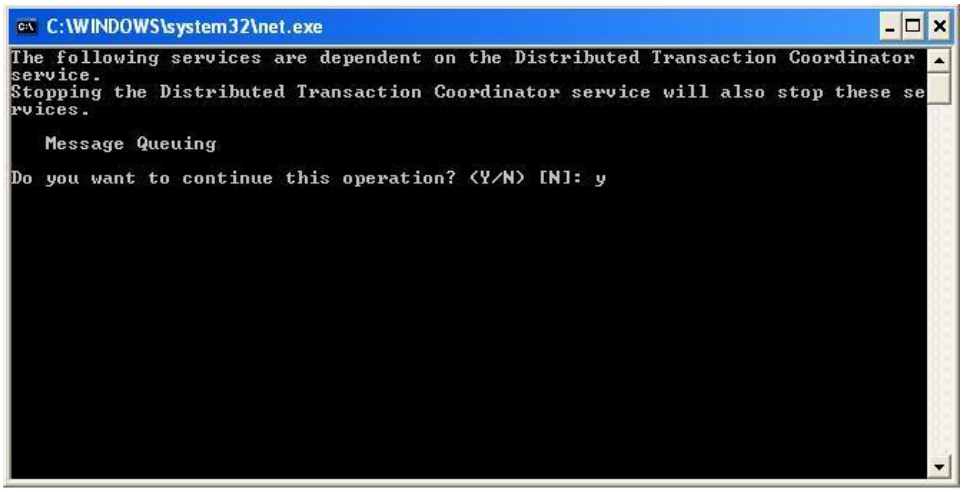
19.2.6 Installation Windows XP Professional

After installing the Windows XP Professional Image, the following message will pop up when starting up the device again:

The following services are dependent on the distributed transaction coordinator service. Stopping the distributed transaction coordinator service will also stop these services.

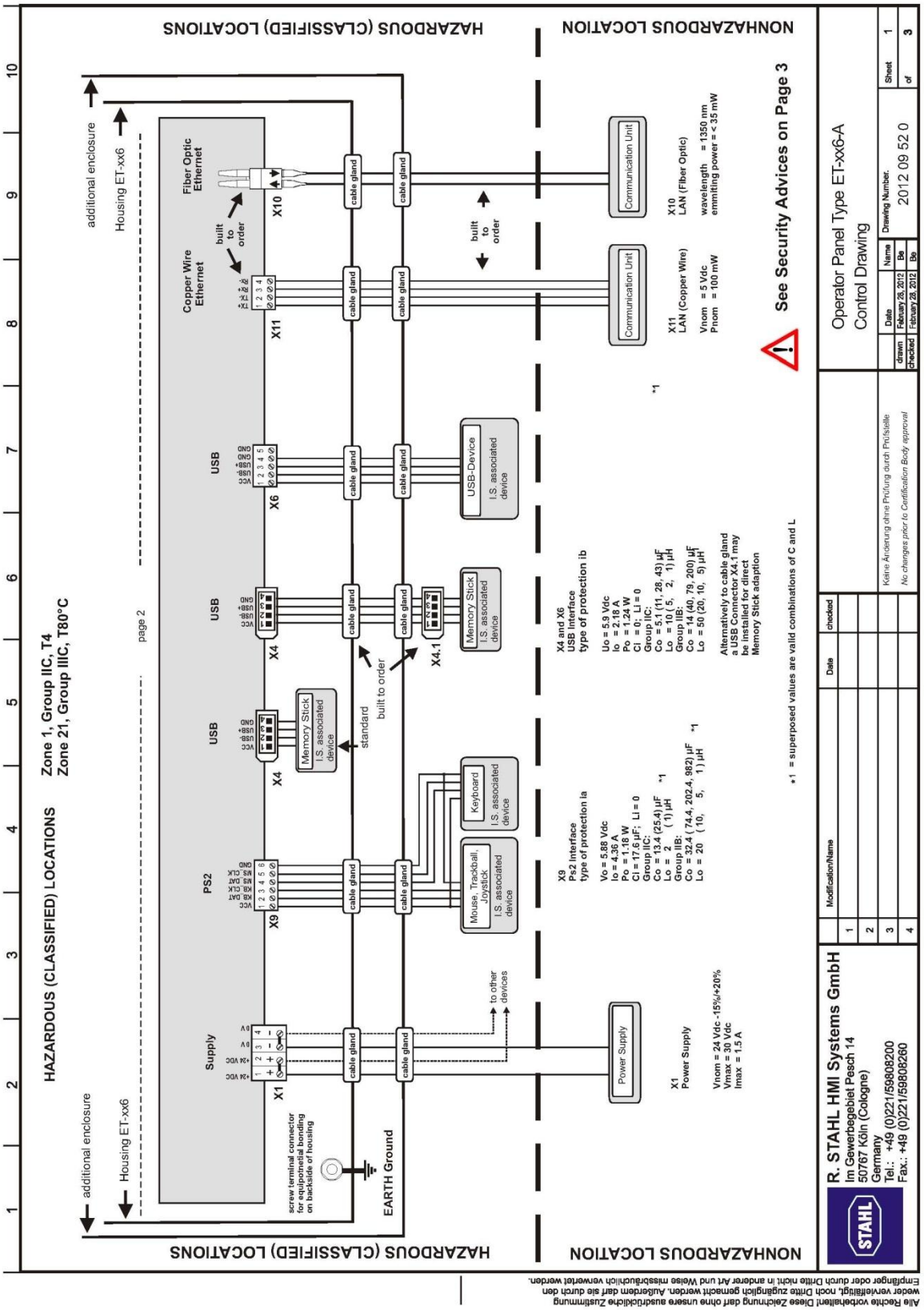
Message Queuing

Do you want to continue this operation ?


C:\WINDOWS\system32\net.exe
The following services are dependent on the Distributed Transaction Coordinator service.
Stopping the Distributed Transaction Coordinator service will also stop these services.
Message Queuing
Do you want to continue this operation? (Y/N) [N]: y

The MSDTC service is necessary for the SQL server, which in turn is necessary for Siemens WinCC. For this reason, the message **MUST** be confirmed with **YES**, otherwise the start-up of this service will fail.

20 CSA Control Drawing



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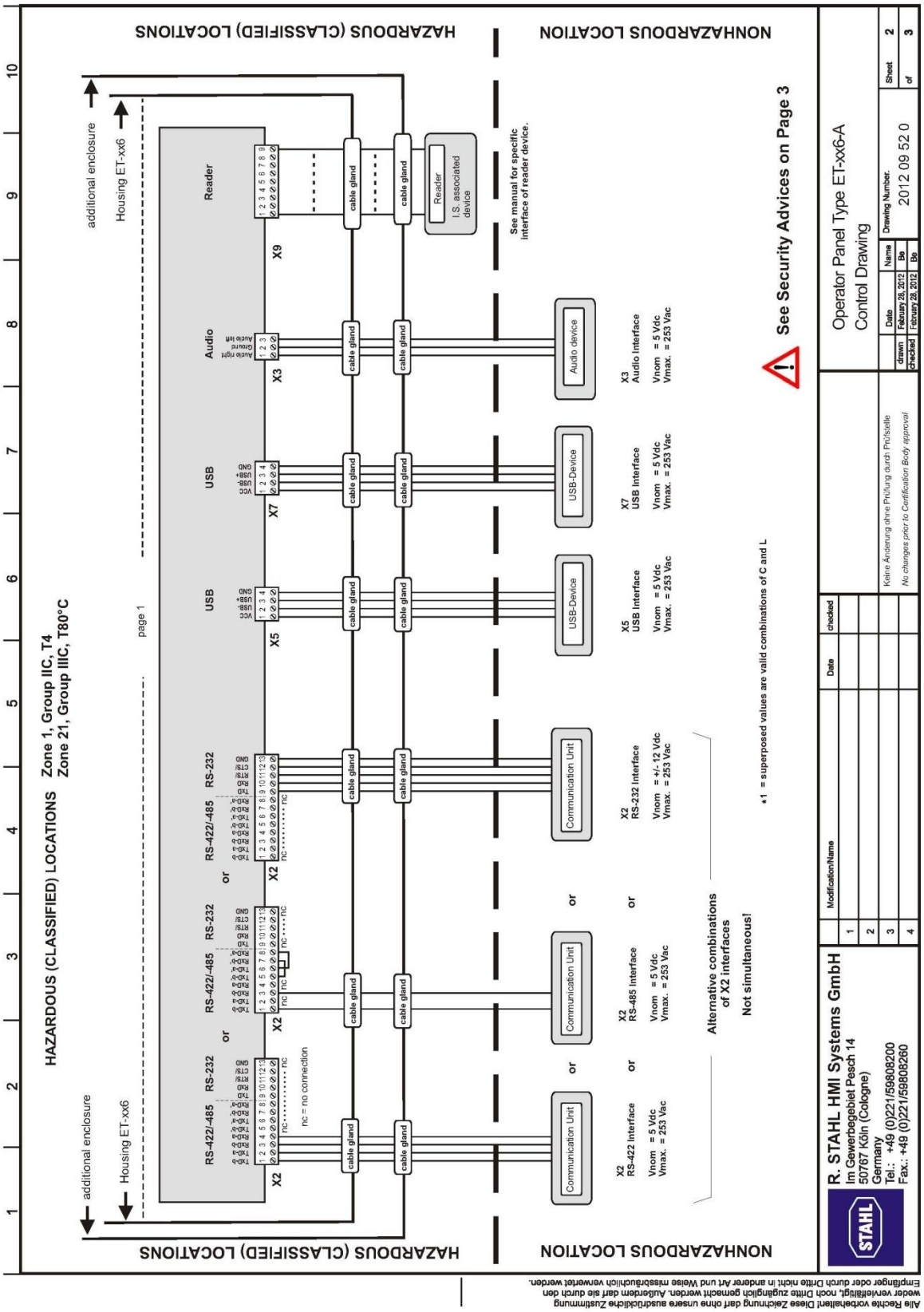

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Security Advices

1. No revision to drawing prior to certification body.
2. The Associated Apparatus must be approved by a NRTL.
3. Manufacturer's installation drawing must be followed when installing associated apparatus.
4. Interconnection of equipment apparatus type of protection „I.S." with associated apparatus is allowed when the following is true:

I.S. Equipment		Associated Apparatus
Vmax	≥	Uo
Imax	≥	Io
Pi	≥	Po
Ci + Ccable	≤	Co
Li + Lcable	≤	Lo

WARNING:

- Substitution of components may impair Safety.
- To prevent ignition of flammable or combustible atmospheres disconnect power and wait a minimuum of 60s before servicing.

The ET-/MT-xx6 operator interfaces and connected devices must be integrated in the same system of potential equalization.
As an alternative to this, only devices hat are isolated from earth potential may be connected.

All circuits must be wired as specified in the Canadian Electric Code for installation within Canada.

Calculation of cable length

1.) Determination of maximum possible capacitance of cable:

Cmax = Co - Ci (associated Apparatus)

Determination of maximum possible inductance of cable:

Lmax = Lo - Li (associated Apparatus)

2.) Determination of maximum possible cable length by capacitance and inductance of cable:

length C = $\frac{\text{Cmax}}{\text{Ccable}}$ (*1)

length L = $\frac{\text{Lmax}}{\text{Lcable}}$ (*1)

3.) Determination of maximum length of cable:

length C or lenght L, whatever is less.

(*1) when cable parameters are unknown, the following values may be used:

Cable = 60 pF/ft. (200 pF/m)
Lcable = 0.2 µH/ft. (0.66 µH/m)

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	Modification/Name	Date	checked
1			
2			
3			
4			

Kleine Änderung ohne Prüfung durch Prüfstelle
No changes prior to Certification Body approval

Operator Panel Type ET-xx6-A
Control Drawing

	Date	Name
drawn	February 28, 2012	Be
checked	February 28, 2012	Be

Drawing Number.
2012 09 52 0

Sheet 3
of 3

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21 Declaration of EC conformity

EG-Konformitätserklärung
EC-Declaration of Conformity
Déclaration de Conformité CE

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erklärt in alleiniger Verantwortung, *declares in its sole responsibility, déclare sous sa seule responsabilité,*

dass das Produkt *that the product* *que le produit*	**Bedien- und Beobachtungsgeräte** *Operating and Monitoring Devices* *Consoles de commande et de visualisation*
Typ, *type, type:*	**EXICOM** **MT-306-A-*-**; MT-406-A-*-**; MT-506-A-*-**;** **MT-316-A-*-**; MT-416-A-*-**; MT-516-A-*-**;** **MT-336-A-*-**; MT-436-A-*-**; MT-536-A-*-**** **MT-356-A-*-**; MT-456-A-*-**; MT-556-A-*-**** * = Fx or Tx; ** = HDn and/or SR and/or additional information (not ex-relevant)
Kennzeichnung, *marking, marquage:*	TypeTX: II 3 (2/3) G Ex d e ia ib mb nA [ib Gb] [ic] IIC T4 Gc II 3 (2/3) D Ex ia tc [ib Db] [ic] IIIC T80°C Dc IP66 Type FX: II 3 (2/3) G Ex d e ia ib mb nA [ib op is Gb] [ic] IIC T4 Gc II 3 (2/3) D Ex ia tc [ib op is Db] [ic] IIIC T80°C Dc IP66
mit der EG-Baumusterprüfbescheinigung, ***ausgestellt durch Benannte Stelle:*** *under EC-Type Examination Certificate,* *issued by notified body:* *avec Attestation d'examen CE de type,* *exposé par organisme notifié:*	**TÜV 11 ATEX 7103 X** **TÜV Rheinland Industrie Service GmbH** Am grauen Stein 51105 Köln (Cologne) Germany

auf das sich diese Erklärung bezieht, mit den folgenden Normen oder normativen Dokumenten übereinstimmt
which is the subject of this declaration, is in conformity with the following standards or normative documents
auquel cette déclaration se rapporte, est conforme aux normes ou aux documents normatifs suivants

Bestimmungen der Richtlinie *Terms of the directive* *Prescription de la directive*	**Nummer sowie Ausgabedatum der Norm** *Number and date of issue of the standard* *Numéro ainsi que date d'émission de la norme*
94/9/EG: ATEX-Richtlinie *94/9/EC: ATEX Directive* *94/9/CE: Directive ATEX*	IEC 60079-0:2011 IEC 60079-1:2007 IEC 60079-7:2006 IEC 60079-11:2011 IEC 60079-18: 2009 IEC 60079-28: 2006 IEC 60079-31: 2008
2004/108/EG: EMV-Richtlinie *2004/108/EC: EMC Directive* *2004/108/CE: Directive CEM*	EN 61326-1:2006

Köln, 29.02.2012

Ort und Datum
Place and date
Lieu et date

J. Düren
Technical Director

W. Bertges
Quality Manager

Datei: CE_MT-xx6-A_20110818.docx

Vorlage: F058_EG-Konformerklärung-HMI_20110325.docx

22 Release notes

The chapter entitled "Release Notes" contains all the changes made in every version of the Operating Instructions.

Version 03.00.07

- Device allocation according to new classification; titles and texts changed/complemented
- Texts in chapter "Device Function" changed
- Inclusion of CSA certification
- Inclusion of UL-BR certification
- Addition of CSA marking
- Addition of UL-BR marking
- Renew DNV certification and number
- Change of certification table layout
- Addition of CSA Control Drawings
- Removal of hard disk replacement instructions
- Inclusion of note on BA Hard Disk for "Instructions on hard disk replacement"
- Technical Data and licensing information expanded to include WIN 7
- Removal of older hardware statuses
- Text and layout changes

Version 03.00.08

- Text and layout changes
- Rename into Panel PC (MT-4x6) and Thin Client (MT-5x6)
- Changing of data cable definition in "technical data", lenght specified
- Changing of "technical data"
- Type code adapted
- Removal of sections and infos of X12
- Correction of CSA marking
- Inclusion of note to hard disk "usage instead of a flash memory"

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